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Inclusive Jet Cross Section Update: 141 pb^{-1}

Results based on 141 pb^{-1}, 70% more data!

Used offline version 4.10.4

Redid Calorimetery and Jet reconstruction
$\rightarrow$ corrected the falling response in the high η region...

ntuples based on DataAccess located at:

`fcdfsgi2:/cdf/data40b/s0/qcd/chlebana/jets_4.10.4`

Good Run Selection

```
AND rc.SHIFTCREW_STATUS = 1
AND rc.RUNCONTROL_STATUS = 1
AND RC.RUNNUMBER >= 138815
AND rc.CLC_STATUS = 1
AND rc.L1T_STATUS = 1
AND rc.L2T_STATUS = 1
AND rc.L3T_STATUS = 1
AND rc.CAL_STATUS = 1
AND rc.CAL_OFFLINE = 1
AND (rc.COT_STATUS = 1 OR rc.COT_OFFLINE = 1)
```

Started with gjet08 and gjet09 datasets: 173.9 pb^{-1}

Offline bits set for runs: 138815 - 163527

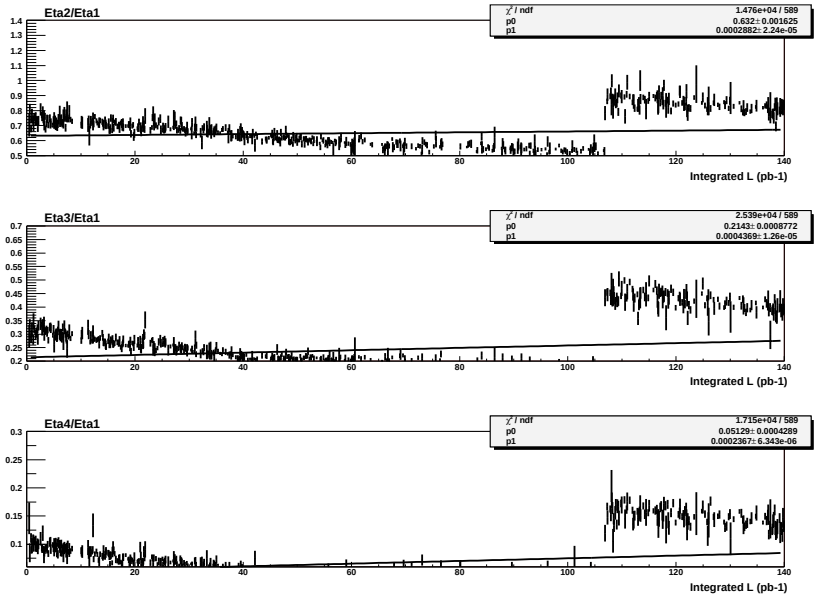
No "good run info" for runs: 163956 - 164451 (about 5 pb^{-1})
Just included these runs...

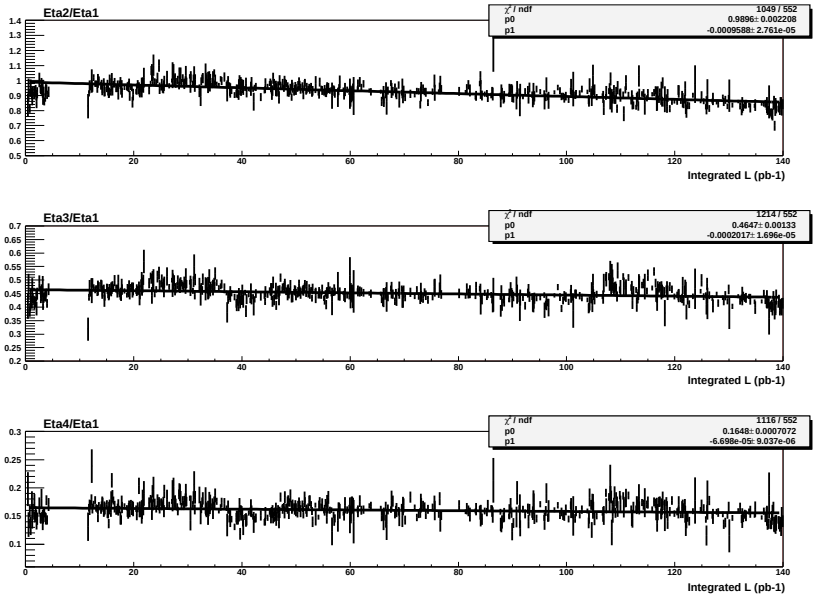
Also require that event count for the J20 in ntuple match with that recorded in the database, removed 25 runs for 8.4 pb^{-1}

32 pb^{-1} do not pass this good run criteria

About 5 pb^{-1} of data unprocessed

Some of the run dependence on the jet energy scale was removed in the reprocessing.

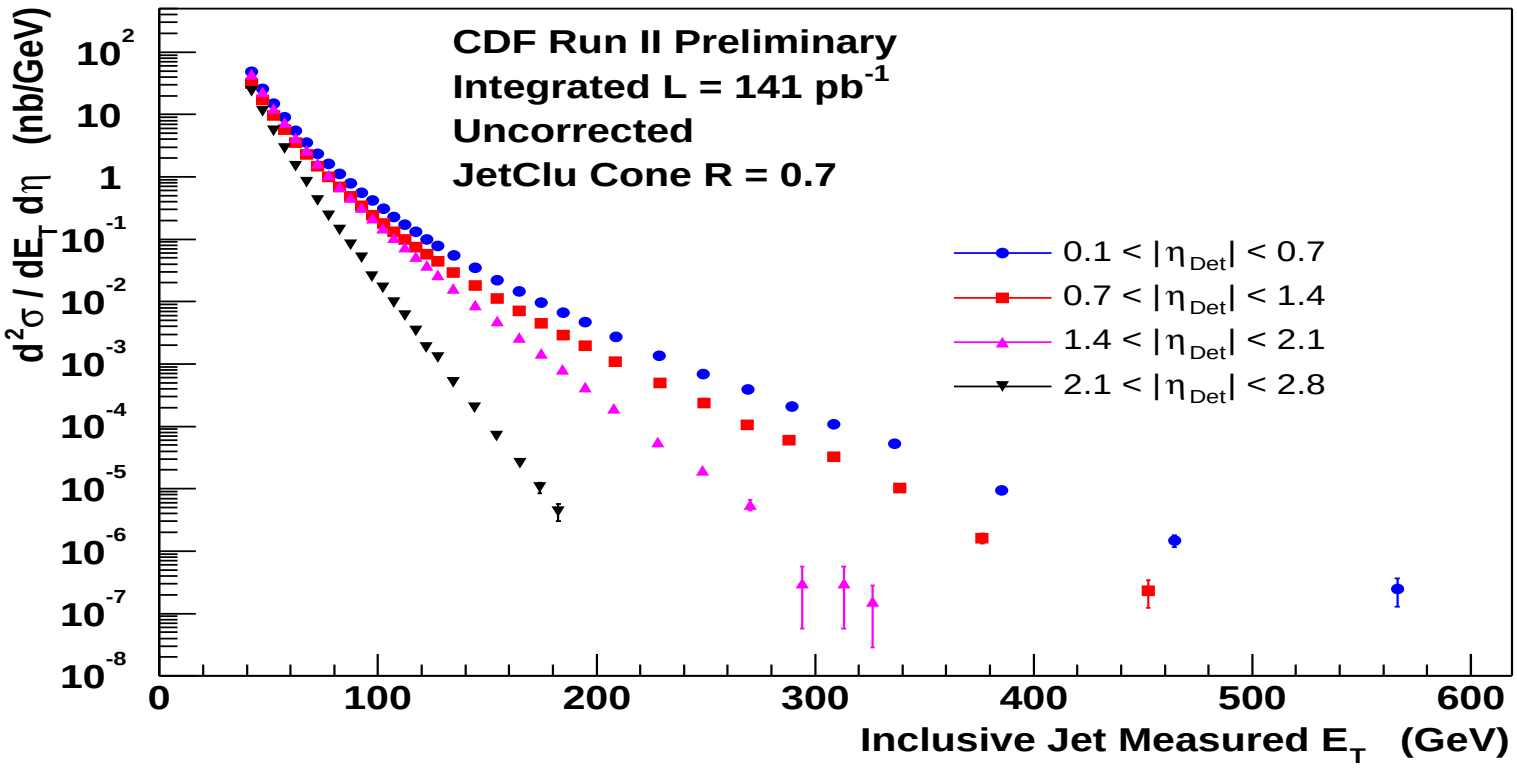




Opens up the posibility to start looking in the forward η region

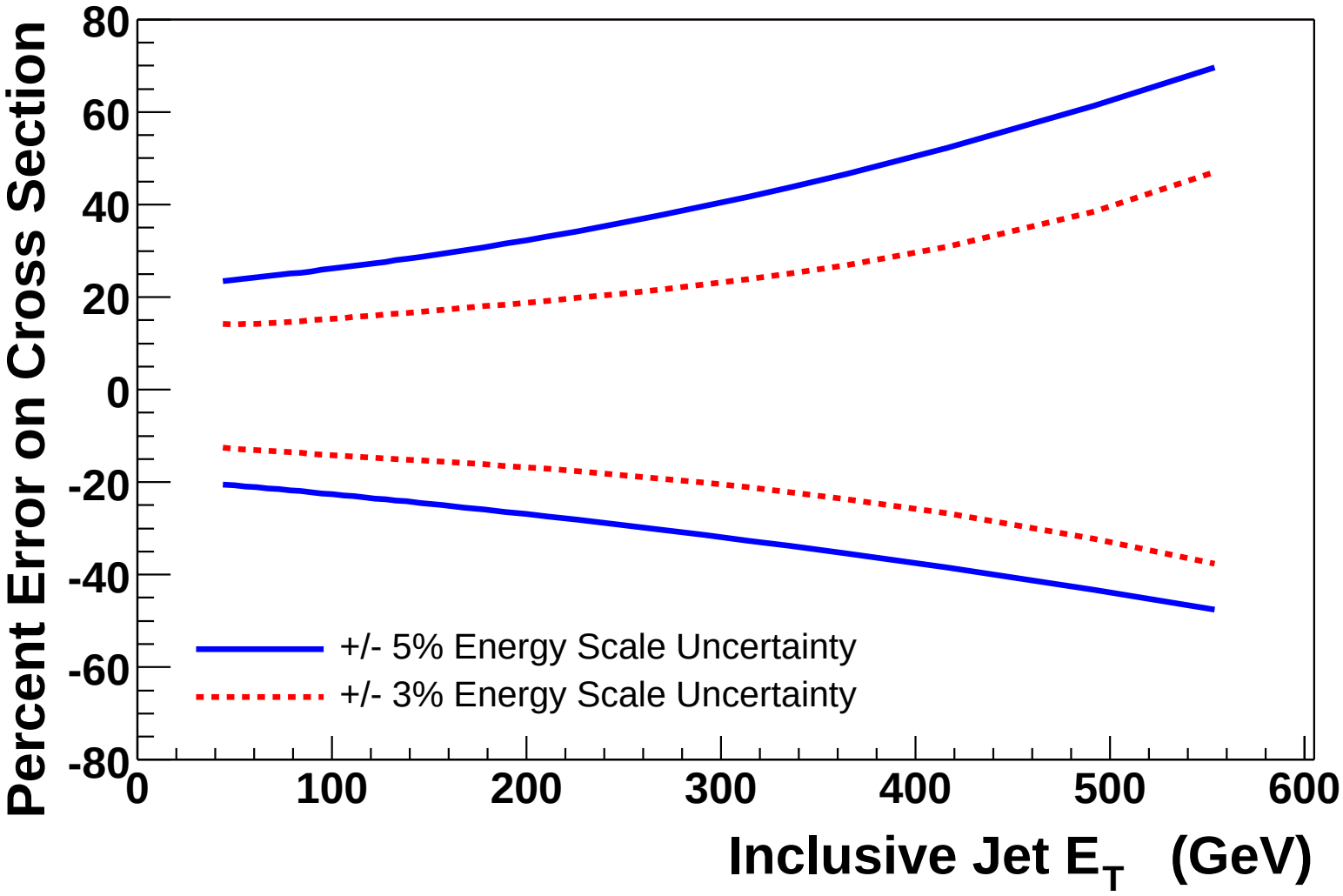
Jet energy corrections depend on the version of the offline used to process the events, corrections are now available for 4.10.4 or 4.11.1.

May be already able to look at the ratio of cross section for the forward region to the central... Same Side/Opposite Side jets...

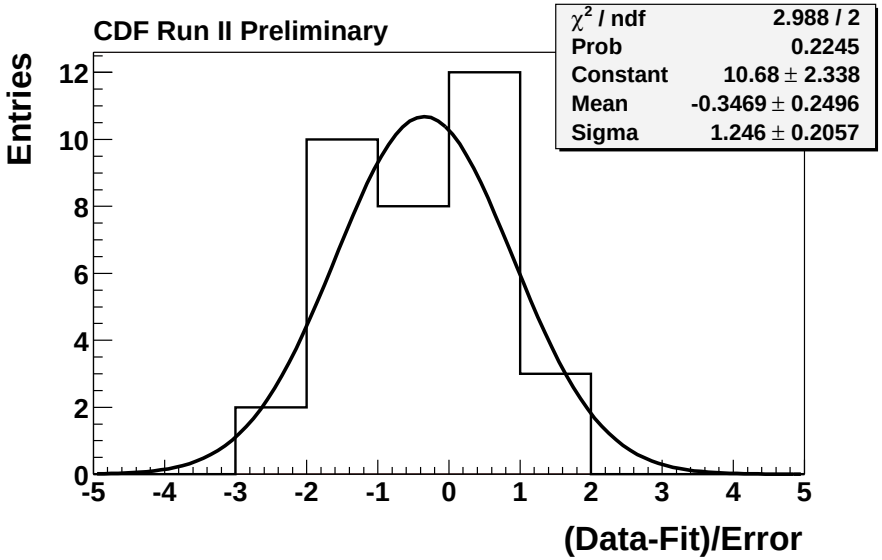


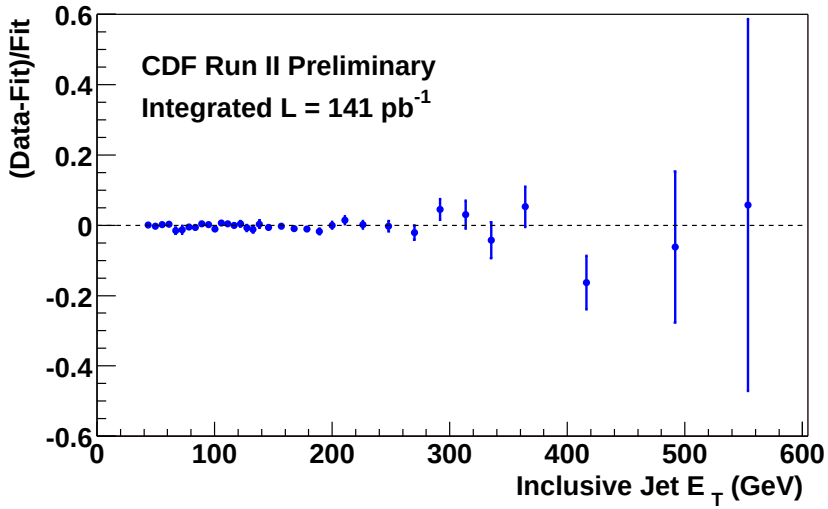
Need to have the response functions determined for the forward region $\longrightarrow$ inclusive jet cross section measurement in the forward region...

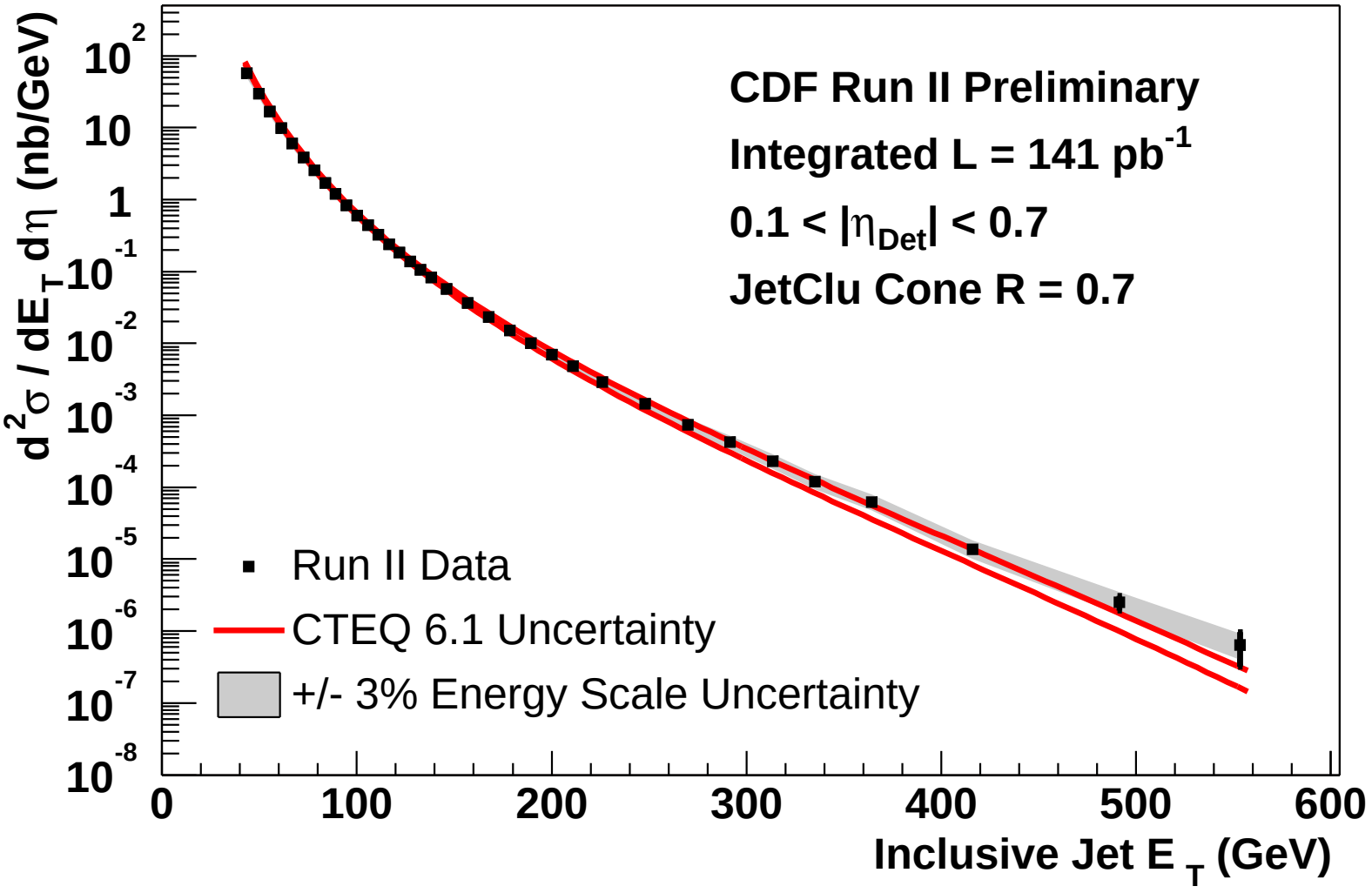
Expect to have a better understanding of the energy scale uncertainty

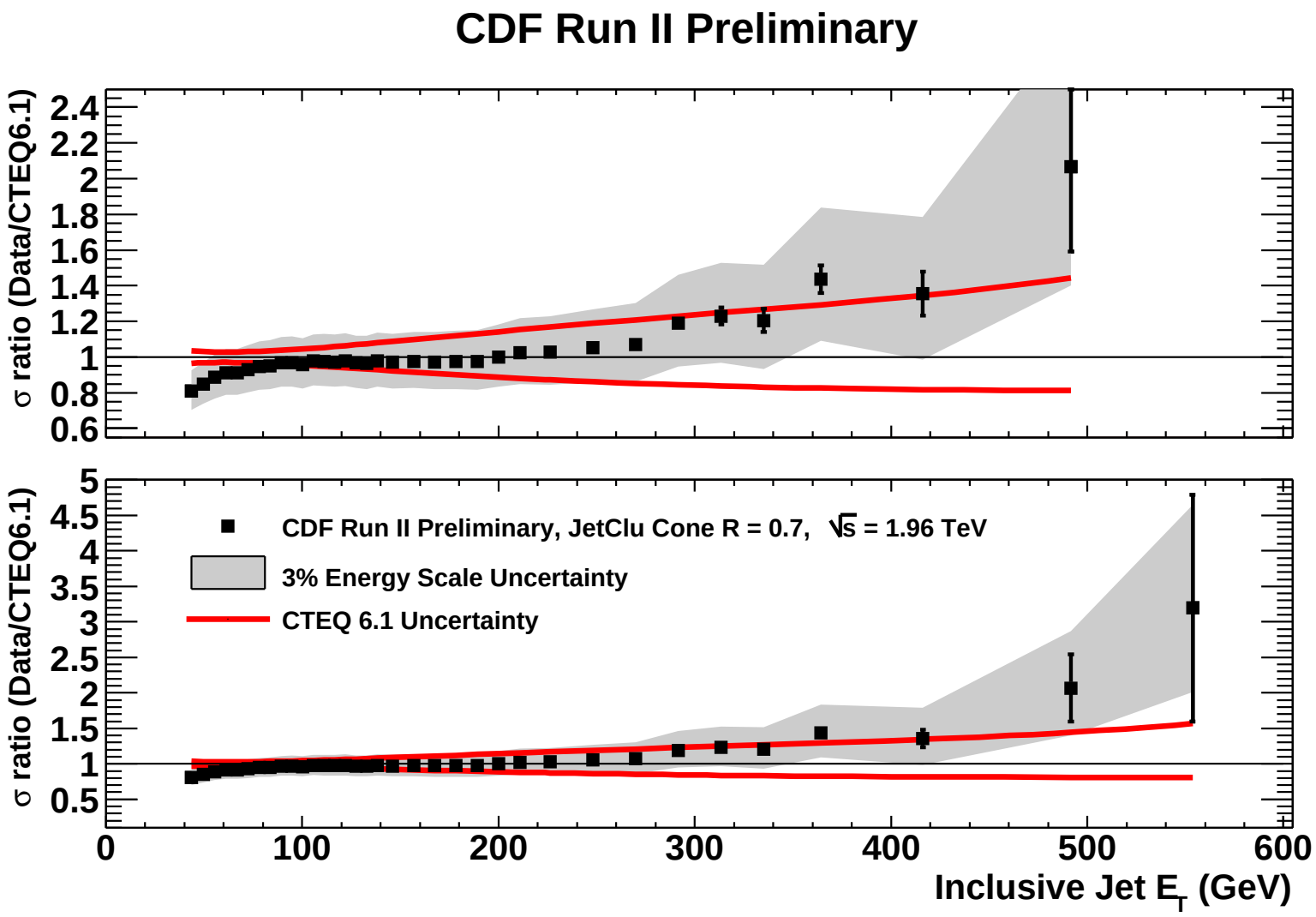


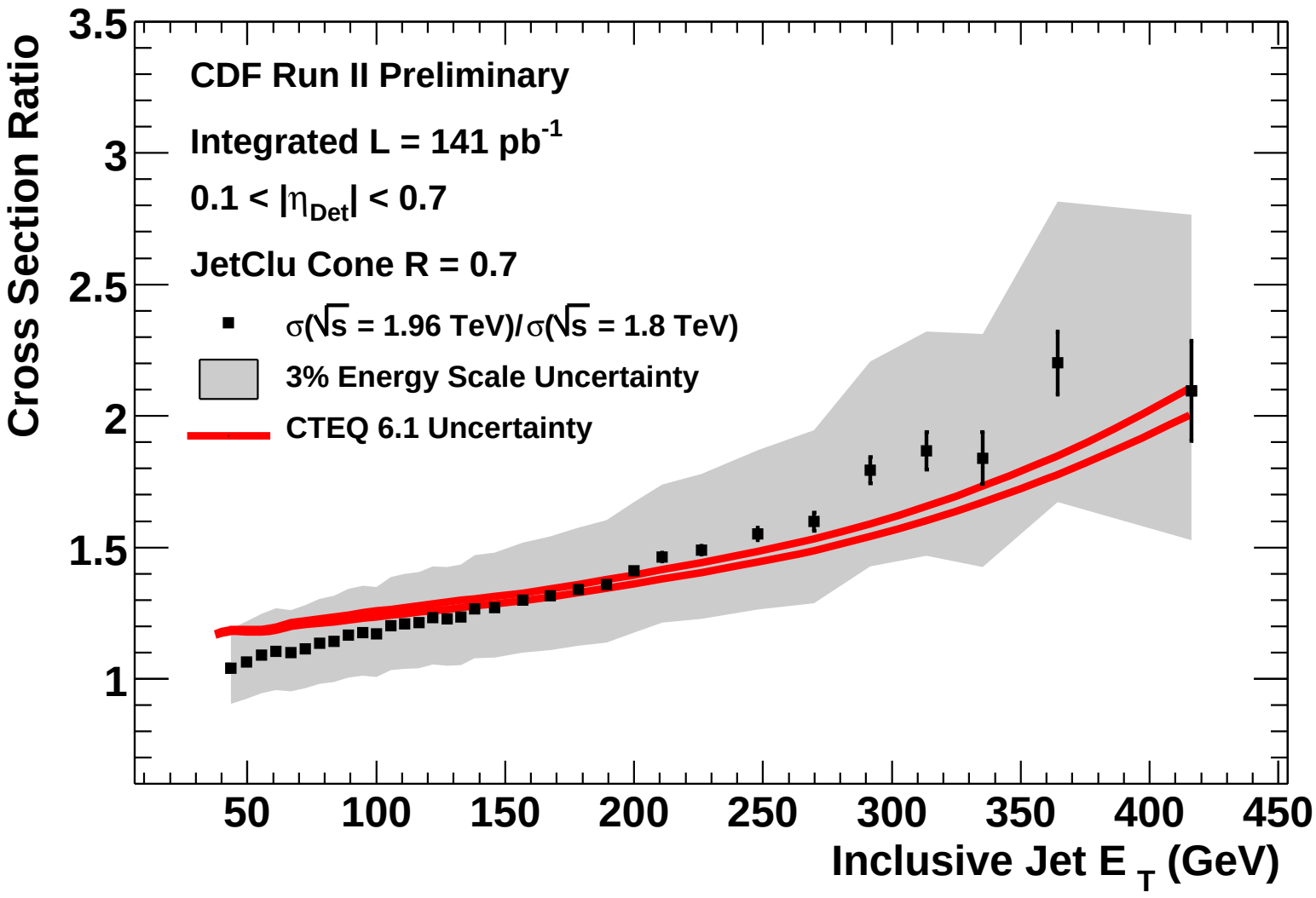
With the increased statistics the data is smoothing out.



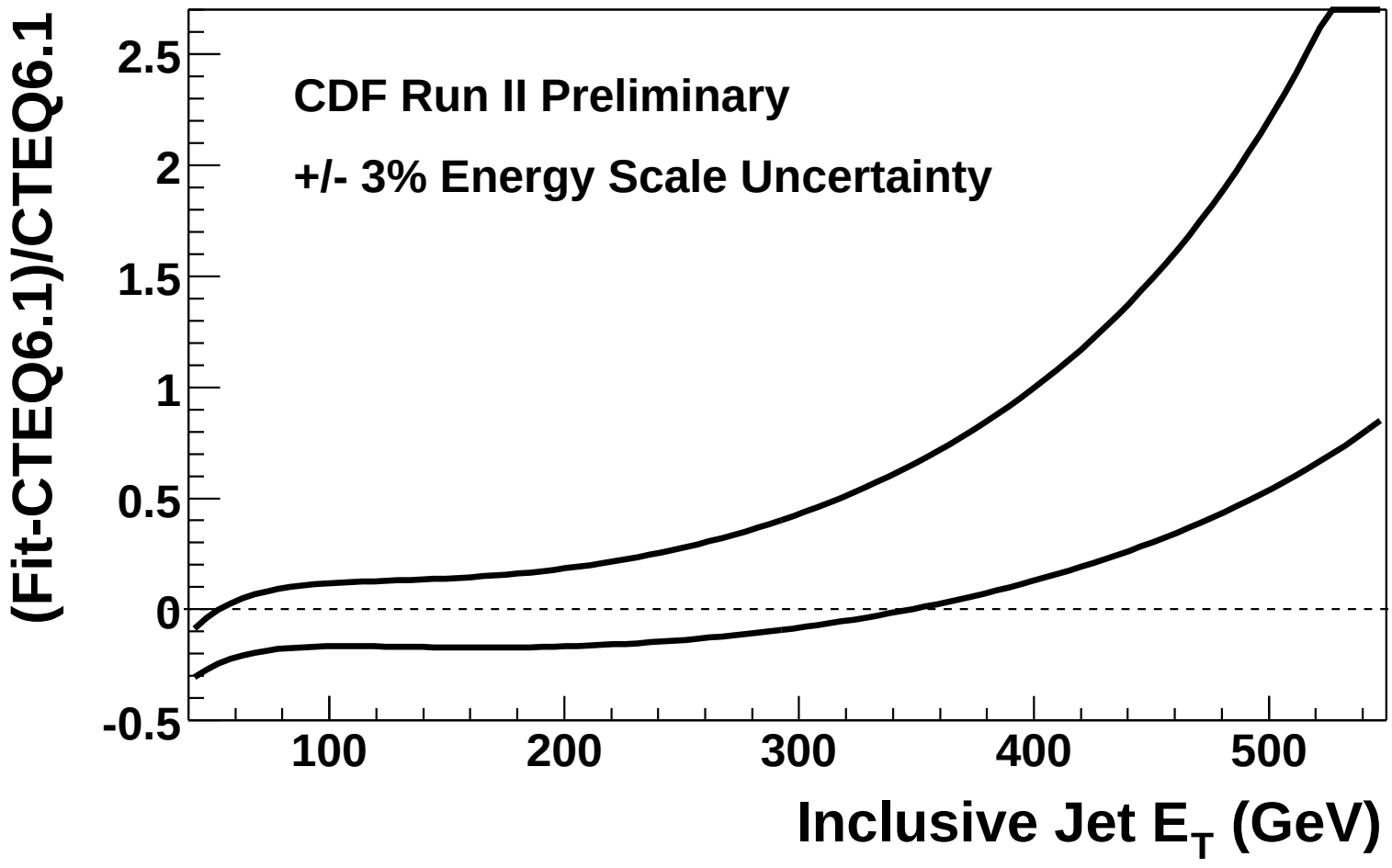



CDF Run II Preliminary
Integrated L = 141 pb-1
0.1 < |ηDet| < 0.7
JetClu Cone R = 0.7
Run II Data
CTEQ 6.1 Uncertainty
+/- 3% Energy Scale Uncertainty
d2σ / dET dη (nb/GeV)
Inclusive Jet ET (GeV)
10^2
10
1
10^-1
10^-2
10^-3
10^-4
10^-5
10^-6
10^-7
10^-8
0
100
200
300
400
500
600


CDF Run II Preliminary
σ ratio (Data/CTEQ6.1)
2.4
2.2
2
1.8
1.6
1.4
1.2
1
0.8
0.6
σ ratio (Data/CTEQ6.1)
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
CDF Run II Preliminary, JetClu Cone R = 0.7, √s = 1.96 TeV
3% Energy Scale Uncertainty
CTEQ 6.1 Uncertainty
0
100
200
300
400
500
600
Inclusive Jet E_T (GeV)


CDF Run II Preliminary
Integrated L = 141 pb-1
0.1 < |ηDet| < 0.7
JetClu Cone R = 0.7
σ(√s = 1.96 TeV)/σ(√s = 1.8 TeV)
3% Energy Scale Uncertainty
CTEQ 6.1 Uncertainty
Cross Section Ratio
Inclusive Jet ET (GeV)
3.5
3
2.5
2
1.5
1
50
100
150
200
250
300
350
400
450

The error band on the cross section resulting from a 3% error on the energy scale.



The problem at low E_T is still there...

$\rightarrow$ Was hoping to compare the data to the MC in the low E_T region

$\rightarrow$ Had problems running over the MC with 4.11.1 (memory leak)

$\rightarrow$ Was able to run over the MC using 4.10.4

Also need to start using the hadron timing information to reject background

Getting close to nearly doubling the data sample 83 $\rightarrow$ 141 pb^{-1}
$\rightarrow$ The increased statistics is smoothing out the data

Improved understanding of the energy scale uncertainty 5 $\rightarrow$ 3%

Need to:

- Validate the response function using the Run II MC
- Provide response function in the forward η region
- Make sure that the good run bits are up to date
- Make sure that the luminosity is up to date and blessed
- Use the blessed final uncertainty on the jet energy scale

Should start looking at the data quality more carefully to try to recover some of the lost runs.

Also should follow up why event counts in ntuple and database do not agree.